REMARKS

Claims 1-7 and 26-44 are currently pending in the above-entitled application. Claims 8-25 have been previously withdrawn from consideration.

The oath or declaration stands rejected as being defective. A new application data sheet is being filed along with the Response that complies with 37 C.F.R. 1.67(a), as suggested by the Examiner. Reconsideration is thus respectfully requested.

Claims 2 and 27 stand rejected under 35 U.S.C. 112, second paragraph as being indefinite for reasons stated on pages 2 and 3 of the Office Action. Applicant has amended claims 2 and 27 to clarify the plies are compacted, and amended claim 27 to clarify the fibers. Applicant believes the basis for the rejection has thereby been overcome.

Claims 1-3, 26-28, 33-34, and 39-40 stand rejected under 35 U.S.C. 102(b) as being anticipated by or, in the alternative, under 103(a) as obvious over Grisch (U.S. Patent No. 4,207,282). Claims 4-7, 29-32, 35-38, and 40-44 stand rejected under 35 U.S.C. 103(a) as being obvious over Grisch (U.S. Patent No. 4,207,282), as applied to claims 1 and 3. Claims 1-7 and 26-44 also stand rejected under 35 U.S.C. 103(a) as being obvious over the admitted prior art in view of Stoops (U.S. Patent No. 4,141,929) or Grisch (U.S. Patent No. 4,207,282). Applicant respectfully traverses the Examiner's rejection.

In the Examiner's remarks, stated and reiterated in bold on pages 4 and 6 of the Office Action, the Examiner states:

> "Whether filaments are chopped in bundle form (i.e. unfilamentized or partially filamentized) or not (i.e. filamentized), the resultant particles are chopped filaments."

Applicants respectfully disagree with the interpretation of the claim limitation. Specifically, the Examiner points to Grisch for filamentary fibers. Presuming that filamentary defines the bundles as being made from filaments, this aspect of the rejection is not disagreeable. However, Applicants claim a variation of "filamentized", not "filamentary". As understood by one skilled in the art, "filamentized" relates to the integrity of the strand (how well the strand filaments stay together), not whether there are filaments present (is "filamentary"). Evidence of this definition is shown in the attached webpage http://www.netcomposites.com/glossary.asp?letter=f, which defines

> "Filament" (basis for filamentary) as: "The smallest unit of a fibrous material. The basic units formed during drawing and spinning, which are gathered into strands of fiber for use in composites", and
>
> "Filamentization" as: "A phenomenon in which a coated strand breaks up into loose individual filaments."

This limitation is not a product-by-process limitation, as suggested by the Examiner, but instead is a physical limitation of the bundles; i.e. the nature of the bundle to remain intact. Thus, by their nature, unfilamentized fibers are not the equivalent of partially filamentized fibers nor are they the equivalent of filamentized fibers. In addition, partially filamentized fibers are not the equivalent of filamentized fibers. Thus one skilled in the art will select a glass which either has or does not have the requisite integrity for the desired filamentation, and therefore the process does not affect this fundamental fact.

As such, the Examiner has failed to point to any aspect of the prior art which relates to the claimed limitation of filamentization.

In fact, Grisch teaches away from the claimed invention of providing a resin impregnated filamentized fiber layer. Instead, Grisch teaches providing a veil – which by its very nature is not filamentized, but is instead a continuous sheet.

Grisch describes the process in Column 2, line 40 through Column 3, line 25 of the '282 patent, as providing an elastic veil to create a barrier against the fibers. Grisch requires the veil to have a grab break strength of at least 10 pounds per inch in both longitudinal and transverse directions, a tensile elongation of at least 10%; and a

permeability to permit the liquid resin to pass through the veil during molding. Grisch further indicates that a fabric lacking these properties is liable to tear during the molding operation. Grisch's examples include nylon, fiberglass, dacron, or other thermoplastic material. The only glass mats indicated include a continuous filament fiberglass mat and woven fiberglass mat; neither of which is filamentized. By the nature of these examples, Grisch teaches away from a filamentized layer.

The present invention, on the other hand, a layer of resin impregnated filamentized fibers. As described throughout the specification (and specifically described on page 15, paragraph 0033, for example), the filamentized fibers are prevented from penetrating within the unfilamentized or partially filamentized layer during compaction in the present application. The compacted sheet, when cured, forms a composite part in which a visible surface layer forms a resin rich and nearly porous free layer that has improved surface characteristics with less surface pores as compared with traditional sheet molding compounds such as Grisch. As Grisch does not disclose a composite part formed with chopped unfilamentized or partially filamentized fibers in combination with a filamentized layer, Grisch cannot form a composite part having the same resin rich and nearly porous free layer. Thus, the present invention is novel, notwithstanding the Grisch reference.

Stoops et al. , as stated in the previous Office Action, teaches embedding continuous axially aligned filaments to the resin paste layer. Stoops, similar to the prior art and Grisch, does not therefore teach the use of chopped unfilamentized fibers or the use of chopped partially filamentized fibers in addition to a layer of resin impregnated filamentized fibers, to form a composite part having a resin rich and substantially porous free layer having improved surface characteristics. As such, the presently claimed invention is novel, notwithstanding the Stoops reference. Further, the present claimed invention is novel, notwithstanding the combination of Stoops and Grisch and the Admitted Prior Art. Reconsideration of the claims is respectfully requested.

Further, because Grisch, Stoops and the Admitted Prior Art in combination do not disclose the presently claimed invention, as required by MPEP 2143, the remaining

claims are non-obvious in view of the cited prior art. Reconsideration of the claims is respectfully requested.

In view of the foregoing amendments and remarks, Applicant submits that claims 1-7, and 26-44 are allowable. The Examiner is invited to telephone the Applicant's undersigned attorney at (740) 321-7167 if any unresolved matters remain.

If necessary, the Commissioner is hereby authorized to charge payment or credit any overpayment to Deposit Account No. 500568 for any additional fees required.

Respectfully submitted,

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Dated: 4-26-04

Glossary

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

Fabric, Nonwoven
A material formed from fibers or yarns without interlacing (e.g., stitched bonded, nonwoven broadgoods).

Fabric, Woven
A material constructed of interlaced yarns, fibers or filaments produced by the weaving process.

Fabrication
The process of making a composite part or tool.

Feathered Edge
A fabric edge that tapers down in weight instead of abruptly ending.

Fiber
A general term used to refer to filamentary materials. Often, fiber is used synonymously with filament.

Fiber Architecture
The design of a fibrous part in which the fibers are arranged in a particular way to achieve the desired result. This can include braided, stitched or woven fabrics, or mats, rovings or carbon tows.

Fiber Content
The amount of fiber present in a composite. This is usually expressed as a percentage volume fraction or weight fraction of the composite.

Fiber Diameter
A term used to denote the diameter of continuous glass filaments. Their diameter can vary depending on the purpose for which they are to be used. Can be expressed in letter designation, microns or inches.

Fiber Direction
The orientation or alignment of the longitudinal axis of the fiber with respect to a stated reference axis.

Fiber Glass
Primarily means glass in fiber form. However, "fiber glass" is also used to describe composite processing and applications. Examples of usage: fiber glass molding plant, fiber glass car.

Fiber Orientation
The fiber alignment in a nonwoven or a mat laminate in which most of the fibers are in the same direction, thereby affording higher strength in that direction.

Fiber Pattern
Visible fibers on the surface of laminates or moldings; the thread size and weave of glass cloth.

Fiber Prominence
The appearance of reinforcement fibers in the surface of a molded part. Can also be termed pattern print-through, strike-through or fiber pattern.

Fiber Reinforced Plastics (Frp)
A general term for composite materials or parts that consist of a resin matrix that contains reinforcing fibers such as glass or fiber and have greater strength or stiffness than the resin. FRP is most often used to denote glass fiber-reinforced plastics.

Filament
The smallest unit of a fibrous material. The basic units formed during drawing and spinning, which are gathered into strands of fiber for use in composites. Filaments usually are of extreme length and very small diameter, usually less than 25 micron. Normally filaments are not used individually. Some textile filaments can function as yarn when they are of sufficient strength and flexibility.

Filament Winding
A process for fabricating a composite structure in which continuous reinforcements (filament, wire, yarn, tape, or other), either previously impregnated with a matrix material or impregnated during the winding, are placed over a rotating and removable form.

See also - , ,
Link -

Filamentization
A phenomenon in which a coated strand breaks up into loose individual filaments.

Fill
That part of a woven fabric in which the strands are perpendicular to the main direction of the fabric (warp), the strands running from selvage to selvage . Also called weft.
See also - **Weft**

Filler
A relatively inert substance added to a material to alter its physical, mechanical, thermal, electrical, and other properties or to lower cost or density. Sometimes the term is used specifically to mean particulate additives.

Film Adhesive
An adhesive in the form of a thin, dry, resin film with or without a carrier, commonly used for adhesion between layers of laminates.

Flame Retardants
Certain chemicals that are used to reduce or eliminate a resin's tendency to burn.

Flash
Excess material which forms at the parting line of a mold or die, or which is extruded from a closed mold.

Flow
The movement of resin under pressure, allowing it to fill all parts of a mold; flow or creep the gradual but continuous distortion of a material under continued load, usually at high temperature.

Flow Line
A mark on a molded piece made by the meeting of two flow fronts during molding. (Also, 'striae', or 'weld-mark,' or 'weld-line.')

Fly
Loose filaments of fiber that have broken from their parent strand during processing and are freely floating in the air.

Frp
Acronym for fiber glass-reinforced or fiber-reinforced plastic, polymer or polyester.

Fuzz
Detached and broken glass fiber that has collected on processing equipment.